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Leading Articles

Open-Joints: and Their Treatment in My Practice*

By J. V. LACROIX, D. V. S., Hiawatha, Kansas

In my practice, open-joints are the result of accidental injury such as wire cuts, wounds inflicted by farm-implements or puncture-wounds of various kinds. I consider no wound an open-joint unless there is a rupture of the capsular ligament of the joint involved. Such wounds may be classified in two general groups as follows: First, wounds in which the trauma has exposed the articulation to view, and second, those, the result of punctures, in which the external wound is small and free drainage is lacking.

Wounds in which the articulation is exposed to view have drainage either all ready provided for, or it is established without hesitancy surgically. With free drainage thus established there is little or no chance for the adjacent tissues to become infiltrated with infected wound discharge. This prevents an extension of the injury and the establishment of a good field for the growth of anærobic bacteria.

Open-joints caused by punctures, unless the puncture is aseptic, produce a swelling which is more painful than is the open wound which exposes the joint to view. Especially is this true if the puncture is of small

*Read at annual meeting of the Missouri Valley Veterinary Association, Omaha, Neb., July 6-7, 1910

diameter, allowing the tissues to partially close the opening immediately after the wound has been made. Where drainage is lacking there follows an exudation which congests the tissues surrounding the injury and all factors favoring germ growth are present. It is perhaps advisable to establish good drainage in such cases as soon as a diagnosis is made.

It is not always an easy matter to recognize an open-joint when first made, but twelve to twenty-four hours later there is no cause for doubt. The condition is then a very painful one; lameness is excessive; there is rise in temperature; acceleration of the pulse and manipulation or palpation of the region affected, occasions great pain.

The treatment of open-joints must be varied to suit the disposition of the animal, the nature and location of the injury, the length of time intervening between the infliction of the wound and the first attention given, and the surroundings in which the patient is kept.

In each and every case in which there exists an open wound the surface surrounding the wound is cleansed thoroughly, the hair is shaved if possible, and the margin of the wound is curretted and cleansed thoroughly with antiseptic solutions.

If there is evidence that the articulation contains infective material, it is washed out with copious quantities, usually as much as six or eight ounces of peroxide of hydrogen. This is followed by injection of an ounce or two of tincture of iodine. Even though the joint appears to be clean some tincture of iodine is used, as it checks the secretion of synovia and is, in every way, beneficial. Care is taken to apply the iodine also to the surface immediately surrounding the wound. The entire wound is then covered with a dusting powder composed of zinc oxide, boric acid, exsiccated alum, phenol and camphor.

This powder is used in abundance and the wound is then covered with a heavy layer of absorbent cotton and well bandaged. This bandage is not disturbed for at least three days and may be left in place for a week. In cases in which it is necessary to keep the dressing on for a week, or in cases where the patient is, through necessity, kept in quarters that are wet or unclean, the first bandage is covered with a layer of oakum which has been saturated in oil of tar and this in turn is held in place by means of several layers of bandages. The bandages are also saturated with oil of tar.

In from one to two months wounds so treated, unless they are foot-wounds, will be ready to dress without being bandaged. It is ordinarily unnecessary to dress foot-wounds, after the discharge of synovia has ceased, oftener than every second week. When the wound has filled with granulation, a protective dressing is applied which is rendered water proof by the use of bandages covered with oil-of-tar. The patient can now be turned out for a month or six weeks without disturbing the dressing. After the removal of the bandages, the only treatment necessary is an occasional application of some mildly antiseptic ointment.

Except in nail pricks of the foot, into open-joints occasioned by punctures, a five percent tincture of iodine is injected if the wound remains sufficiently open and this treatment is continued so long as there is a discharge of synovia. Surgical drainage is established if it is considered practicable and the remainder of the treatment is about the same as for wounds which are open. [The writer here means a solution containing five percent of iodine or one-half the strength of the official tincture.—ED.]

Open-joints occur in horses at pasture and are sometimes not discovered until several days or a week after the injury, and in some instances the wounds are filled with maggots. The only difference in the treatment of these cases is that more time and care is taken in cleansing the wound, more curetting is necessary, and after cleansing the wound with peroxide of hydrogen, the joint is thoroughly washed out with equal parts of tincture of iodine and chloroform. This is followed by the injection of a quantity of seventy-five percent alcohol and the wound is dressed and bandaged as already described. At each subsequent dressing of infected wounds so treated less suppuration is noticed and the synovial discharge usually ceases in from one to two months.

About *ninety percent of all cases of open-joint make complete recoveries*, about four percent partially recover and six percent are fatal. Among the fatal cases are the open-joints with complications as severed tendons, those occasioned by calk wounds, in horses that are stabled, and nail punctures of the feet. The following report of twelve favorable cases is taken from a record of sixty-two cases. The favorable cases are reported, chiefly because there are now enough reports on record of such cases which have terminated fatally.

Case 1. A gray gelding used as a saddle pony received a horizontal wire cut laying completely bare the scapulo-humeral articulation. The margins of the wound were cleansed as heretofore described, a drainage was provided surgically, tincture of iodine was injected and the wound was covered with equal parts of boric acid and exsiccated alum. The horse was kept tied and a diluted tincture of iodine was injected into the wound once daily and the powder applied often enough to keep the wound covered. The case made a complete recovery and the pony was again in service within sixty days.

Case 2. A twelve-hundred-pound bay mare with an open carpal-joint. The wound was an open one about two and one-half inches in length, made transversely and when the member was flexed the articular surfaces of the carpal bones were presented to view. An ounce of tincture of iodine was injected into this joint after having cleansed the margin of the wound and the mare was cross tied in a single stall to keep her from lying down. The owner was instructed to keep the outside of the wound powdered with air slaked lime and a very unfavorable prognosis was given.

I heard nothing further from this case until fifty-nine days from the date of the injury, when I met the owner driving this mare to a buggy.

The wound had healed by first intention and at that time so little cicatrix remained that it was difficult to find it.

Case 3. A brown mare with an open fetlock-joint due to a spike-nail puncture. Lameness was excessive, and joint greatly swollen. Tincture of iodine was injected into the wound and towels dipped in hot antiseptic solutions were applied for several hours daily until the acute stage had passed. Later the mare was turned out to pasture and a vesicant was applied once or twice a month until recovery was complete which was in about six months.

Case 4. A four-year-old bay mare having a wire-cut which opened the tarsus-joint was treated as heretofore described. The wound was kept bandaged for about two weeks and later it was dressed without being bandaged. In 90 days she had completely recovered.

Case 5. A twelve-year-old mare with an open fetlock-joint due to a puncture-wound. The margins of the wound were cleansed and the external wound enlarged to facilitate drainage. Tincture of iodine was injected, the wound was bandaged and dressed, in the manner described above, for a month, when all discharge had stopped. A vesicant was applied, the mare was put to pasture and within sixty days from date of the injury she was being driven on short trips.

Case 6. A two-year-old brown gelding with a wire-cut on the left front foot. The wound extended down through the sole and opened the navicular joint. This colt was very wild and it was necessary to tie him down each time the wound was dressed. The wound was dressed weekly for a month and less frequently thereafter. He was handled eight times, the last dressing was left in place until worn out. Six months later the colt was practically well; a very little lameness being shown when walking on frozen ground.

Case 7. A seven-year-old saddle-horse weighing eleven-hundred-fifty pounds received a wound of the tarsus, laying bare the articular surfaces of a part of the joint. It was impossible to keep this wound bandaged because of the restless disposition of the subject. He received injections of a dilute tincture of iodine every second or third day for a month and the wound was kept covered with the antiseptic dusting powder referred to heretofore. In five months complete recovery had taken place, with the exception of a stubborn skin disturbance which Dr. D. M. Campbell successfully treated six months after the wound was inflicted. The horse is still in use and is absolutely free from lameness.

Case 8. A two-year-old brown gelding with a wire-wound opening the scapulo-humeral joint. This wound was large enough to expose to view the articular portion of the humerus. The same treatment as that given case 1 was instituted and in ninety days the colt was practically well.

Case 9. A three-year-old bay filly was found at pasture with one fore-foot badly injured. The owner intended to destroy her, but a neighbor prevailed upon him to have her treated. Apparently the wound was of about a week's standing and in a very bad condition, filled with maggots

and dirt. Both the navicular and coronary articulations were open. This wound was cleansed in the usual manner and the owner cared for the case the balance of the time because the distance from my office was too great for me to give her personal attention. She made an almost complete recovery in five months.

Case 10. A two-year-old mule with an open navicular joint due to a barb-wire wound. Ordinary care was given this case and in five months recovery was complete and little scar is to be seen. This case received seven treatments.

Case 11. An eighteen-months-old colt at pasture was found down and unable to rise without help. In addition to several wounds of lesser importance there was a large wound on the inner side of the elbow, the joint was open and the entire leg was greatly swollen and in a state of acute infectious inflammation. The colt could not walk, his temperature was 105° F., pulse was rapid and respiration was a little hurried. After advising the owner to put the poor animal out of its misery I left the place. Four days later the owner came to my office and asked if he could borrow some old shears to "trim off some loose hide from that colt." He had left the colt in the pasture and all the care it received was the regular application of a proprietary dusting powder. It made a complete recovery.

Case 12. A family mare, heavy in foal, received a vertical wound of the fetlock joint inflicted by a disc-harrow. The cul-de-sac of the ligament of this joint was opened freely. The wound was dressed in the usual manner and again three days later when no suppuration had taken place. Four days later the patient gave birth to a colt and suckled it right along through her convalescence. This wound healed by first intention and seventy-nine days from the date of the injury the mare was driven to town, two and one-half miles distant, and showed but very little lameness.

Treatment of Azoturia*

By JNO. L. TYLER, D. V. S., M. D., Pomona, California

Eliminant treatment for many diseases is becoming more and more in favor. It is proper that this should be so. We are coming to more and more appreciate the importance of the role played in disease by toxins formed in the body from retained waste matter.

Of all diseases we are called upon to treat, none are more difficult or unsatisfactory than azoturia, and so long as the etiology remains a mystery our treatment must of necessity be largely symptomatic or empiric.

Theories have been advanced as to the cause of this disease ranging from "rheumatic changes in the blood" (Friedberger & Fhrohner) to "a pathological condition of the liver," (Law.) Considering the wide difference of opinion among noted investigators as to the cause of this disease, you will not expect a busy everyday practitioner to advance any

*Read at a meeting of the Southern Auxiliary of the California State Veterinary Medical Association at Los Angeles, June 15, 1910.

theory as to its cause. I will, therefore, in this short article confine myself to its treatment.

When called to a case of azoturia if the animal is on its feet, I try to keep it up; if down at time, I leave him down for the time being at least; making no effort to get him up. When he can raise himself to a natural position it does no harm to let him lie quietly and if he can not, harm is done trying to get him up, as every effort and exertion tends to aggravate the disease, this is self-evident as the disease is brought on by exercise, so why aggravate it by causing further exertions.

If the animal is quiet and shows no cerebral symptoms, I omit giving one ounce of fluid extract of gelsemium but almost every case requires it. Gelsemium is the ideal nerve sedative in azoturia, and in animals which continue down, I give about four doses of 1-2 ounce each during the twenty-four hours; this amount is usually sufficient.

I always give an aloetic ball, catheterize the animal promptly and give one grain of pilocarpine hypodermically, this has the effect of increasing the secretions and increasing peristalsis, which in the majority of cases is lessened or altogether absent. It is to the absence of peristalsis that the colicky symptoms so often present at the outset of the disease are due.

Pilocarpine is suggested by the symptoms. It assists nature to accomplish that which she is trying to do as shown by the profuse sweating and large flow of urine. It has also a depressant effect on the heart which is often running 70 or 80 beats per minute. After these immediate remedies have been given, I prescribe what is with me a sheet anchor in azoturia. It is composed of the following:

℞ Elixir saw palmetto and santal comp.. .....8 ozs.
Fl. ex. belladonna. .....1 oz.
Fl. ex. nux vomica.....1 oz.
Ex. colchicum, sem. fl.....2 ozs.
Fl. ex. buchu, q. s., ...

M. Sig.: One ounce in a little hot water every six hours continuing through the twenty-four hours, or four doses per day.

In this prescription the remedies I consider the most important are the saw palmetto comp. and the colchicum, the others are somewhat synergistic for these.

In azoturia no matter what the cause may be, it is certain that there is a vast amount of waste products to be eliminated from the system and eliminants of a soothing nature are indicated. Saw palmetto and sandalwood are both diuretic and soothing and tend to allay inflammation and also alkalinize the urine and facilitate its easy passage from the body. Colchicum has a purgative, diuretic, and diaphoretic action and relieves the portal circulation, thereby lessening the pressure in the liver. Or to put it in other words, colchicum stimulates the secretions of the stomach and bowels, liver, kidneys and skin, increasing the flow of urine and particularly the elimination of solid matter such as urea, uric acid and phosphates, and is therefore strongly indicated in this disease.

As to applications of any sort to the back, loins and hips in this disease their efficacy is in my mind doubtful, but if anything of this kind is indicated it is only hot water. Liniments and counter-irritants only serve to further torture the already suffering animal. Hot water certainly relieves the congestion and if a hot even temperature can be maintained it is perhaps beneficial; but to put a hot rug on the animal's back, and then to allow the wind to blow on it, rapidly cooling same and then failing to change often, allowing the animal to wear a pack that has become cold and clammy, is in my opinion a serious mistake.

Adrenalin chloride is lauded by some as being a near specific, but personally I have never tried it as about the time it was brought to my attention I was experimenting with the above prescription, and, wishing to give it a thorough trial, I continued its use.

In the past year, I have treated about forty cases of azoturia, ranging in severity from the case that would have recovered unaided if left alone, to the severe cases in which the patient was down from three to six days, and if my memory serves me correctly, I have lost only three cases and I had treated about twenty-five cases before I lost any.

I do not advance this line of treatment as a specific, but I do believe it to be a good and rational one. Another reason why I have delayed in trying adrenalin chloride is because of the extravagant, unreasonable and irrational articles that have appeared in its behalf. I do not mean to say that all of them are in this class, by any means, neither do I doubt that adrenalin has apparently proven beneficial in many cases, but at the same time, this extravagant praise has had the effect of deterring me from its use, especially as the treatment outlined above was giving me so much satisfaction.

In closing, I would invite every one interested in the treatment of azoturia to study the therapeutical action of the drugs employed in the treatment I have outlined, and compare their actions with the symptoms presented and draw his own conclusions as to the rationality of the treatment, and to incidentally give the theory of elimination in the treatment of disease a little more thought, applying it here and there as the occasion arises and I believe you will be surprised at the results you will get in many cases. I believe we fail to appreciate the great importance of autointoxication in many diseases.

Treatment of Azoturia

By B. F. TUMBLESON, Ulysses, Nebraska

Azoturia has been discussed more at veterinary meetings than almost any other disease. We seem to agree that it is indirectly occasioned by high-feeding during inaction, but that is about as far as there is any unanimity of opinion among veterinarians concerning this disease.

I have tried many different lines of treatment for azoturia, but find none other to equal hot applications, anodynes and enemas.

I hobble the patient when down, if necessary to keep him from throwing himself about. Then get a boiler or iron kettle and on a fire nearby, heat up two or three bushels of oats in water and place them in sacks each one half full and lay these along the loins, over the hips and abdomen and then cover with dog-blankets over all, giving a good steaming and sweating. Of course, this is lots of work, but it will pay in the end. I have lost very few cases treated in this manner. I treated one case during the month of March when the patient was three and one-half miles from home and was lying on the edge of a cornfield on ice and frozen ground. In this case I secured straw for bedding, with a fire, a kettle, water and some oats, I soon had him covered and steaming and sweating profusely. We treated him this way about twenty-four hours then put him into a stone-boat and hauled him home. Three hours after coming home the horse was on his feet and in a few days was at his usual work. The following day, I treated another very similar case, using the same treatment. In forty-eight hours this patient was on her feet doing fine, but in this case I must not claim all the credit for my treatment, since the gentleman who owned the mare offered up many fervent prayers for her recovery.

Biologic Products in Therapeutics*

By D. M. CAMPBELL, D. V. S., Chicago, Illinois

The wonderful development in serum-therapy has kept pace during recent years with the rapid progress of the science of bacteriology upon which its advancement largely depends, and anyone who reads medical literature today, either veterinary or in the field of general medicine, will continually come across such terms as serum, immunization, antitoxin, bacterin, vaccine, alexin, toxophore, amboceptor complement, etc. If he lets up on this line of study for but a single season he is apt to find himself confused and to some extent behind the times in this particular line—so rapid is the progress.

A very short review here of the recent progress in the field of immunization, as well as some of the history of immunization and an enumeration of the serums, vaccines, bacterins and antitoxins now in common use, may be of interest.

Immunity is that condition in which an individual or a species of animals exhibits unusual or complete resistance to infection to which other individuals or species show a greater or less degree of susceptibility.

Acquired immunity is that type of immunity which results when an attack of an infectious disease brings about a change which renders the animal subsequently incapable of acquiring that disease, i. e., immune to that disease. Thus an attack of variola in man ordinarily renders that individual incapable of again contracting this disease for a period of several years or perhaps for life. He now possesses an acquired immunity from

*Read at the semi-annual meeting of the Missouri Valley Veterinary Association, Kansas City, Mo., February 2-3, 1910.

smallpox. The same is true of hog-cholera in swine, one attack of which, if the animal recovers confers an acquired immunity thereafter to further attacks. This rule holds for all infections to a greater or less extent; though in some, as for instance for pneumonia and influenza, the degree of immunity is only partial, of very short duration, and followed by increased susceptibility to that particular disease.

Natural immunity is an inherent quality by virtue of which an individual or a species is not susceptible to a given infection, but to which other individuals or species may be liable. For example, cattle are naturally incapable of acquiring glanders, and, therefore, are naturally immune to that disease.

Immunization is the process of conferring immunity, and probably was first practised by the ancient snake-charmers of India. These fakirs induce a recently hatched poisonous reptile to bite them, and they keep this up from day to day until the reptile is full-grown, when its venom has become sufficiently deadly to destroy the life of anyone not gradually accustomed to it.

The Chinese practised a sort of immunization before the Christian era. They immunized against smallpox by endermic inoculation from or by exposure to mild cases. This of course brought on the disease, but more frequently in a mild form; which was the object of the procedure. However, virulent cases of smallpox proving fatal to the victims were by no means an uncommon result of the attempted immunization. This method was later employed extensively in Europe.

Dr. Jenner of England, in 1796, discovered the induction of immunity by an attenuated virus. Possessing the power of observation to a degree with which few are endowed, Dr. Jenner noticed that the women who milked cows affected with pustular ulceration of the teats, and themselves contracted this pustulation about their hands and wrists, did not take variola even during the worst epidemics.

The medical world and the people in general ridiculed the announcement of this discovery by Jenner. His practice was, for a time, ruined and he himself bitterly persecuted. Persons whom he vaccinated were claimed to have been turned into baboons, made dog-faced, and to be otherwise impossibly changed and were stoned out of the community by their neighbors.

When the soundness of his claims was finally established, high honors were showered upon him. Within a decade he was voted altogether $150,000 by the British Government. In twenty-one years he received twenty-eight diplomas from institutions of learning and numerous recognitions from the crowned heads of Europe. The use of smallpox vaccine has now become world-wide, reducing perhaps the most dreaded disease of the European nations to the category of mild infections, and to one of rare occurrence among vaccinated people.

Before the practice of vaccination for the prevention of smallpox the yearly deaths from this disease in Bohemia was 1 in 397 of the popula-

tion. After compulsory vaccination was enforced the deaths per annum from smallpox fell to 1 in 14,741. An equally striking example of what smallpox vaccine has done for the human race may be selected from the annals of any civilized nation. Before Jenner's time smallpox was universally present. It was regarded as a children's disease, because all were susceptible and contracted it at the very first opportunity. It caused an immense infantile mortality. Scarred faces were the rule rather than the exception, and an unpitted face was even regarded as a beauty in itself.

Something of the old dread of smallpox still exists and finds expression in quarantine regulations. However, there is no excuse for quarantines and pest-houses for this disease. The expense of maintaining them is a waste of the public's money. Periodical vaccination for the prevention of smallpox should be compulsory for the benefit of society as a whole.

A Vaccine is an attenuated virus. Unfortunately, considerable carelessness in the use of this term is exhibited by many who should know better. In the production of a vaccine the virus, germ or causative agent of the disease for which we wish to obtain the same is so weakened by unfavorable conditions—usually exposure to heat (pasteurization), sunlight, drying, or residence in an animal only slightly susceptible (jennerization)—that it is no longer capable of causing the disease or only so in a mild form. This substance is termed a vaccine. The use of the term, vaccine, to designate anything but an attenuated or weakened virus or infective body is incorrect.

Various Vaccines.—The number of vaccines in use is not large. The one longest and most used, of course, being the smallpox vaccine. There are two kinds of hog-cholera vaccines, one made by Professor King, the other an Italian product made by Bruschettini. In the King method of producing hog-cholera vaccine the virus is attenuated, or weakened, by a residence of a few hours in the blood of a living horse. This product is still in the experimental stage and its utility is yet to be demonstrated. Anthrax vaccine is one of the older vaccines.

Von Behring's vaccine for the production of immunity to tuberculosis in cattle is well known, as is also Pearson's vaccine for the same purpose. This is called bovovaccine and is prepared from the human type of the tubercle bacillus. The human is less virulent than the bovine type, and when properly selected and used may constitute a vaccine for cattle.

To the list of vaccines probably should be added that of blackleg (although there is some question as to whether it is really a vaccine or a bacterin*), and also Pasteur's antirabic vaccine, about which there is still a discussion as to what it really is.

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*This point was discussed at some length by the Veterinarians present without any definite conclusion being reached. Apparently there was about as much evidence produced on one side as on the other. Perhaps the most decisive evidence given to show that blackleg vaccine contains living bacteria was the statement by Mr. H. P. Rasmussen, manager of the Pasteur Vaccine Company, that while cultures of the blackleg bacillus can not be grown from blackleg vaccine, they can be grown from material taken from the site of injection several months after vaccination. This if found to be true in a large number of cases would offer practically indisputable evidence that the material is a vaccine, and not, as many suppose, a bacterin. It seems incredible that the germs of blackleg can survive a temperature of 190 F. for a period of six hours, and that is the heat to which they are subjected in making blackleg vaccine.

For smallpox vaccine, the longest known and most frequently used of vaccines, the profession of general medicine must depend upon the veterinarian. This vaccine is made commercially, in brief, as follows:

The abdomen of a heifer known to be free from tuberculosis and of all other disease is shaved, ascepticized and endermically inoculated in several lines with variola virus, and these inoculations are protected during the period of incubation by a covering of absorbent cotton. Just as the pustular stage (cow-pox) is reached, the serum, scab, etc., are carefully collected (contamination being avoided as much as possible), and after standing in glycerin some weeks to rid it of undersirable organisms, this fluid constitutes the attenuated form of the virus known as the smallpox vaccine.

The Pasteur Treatment for Rabies consists in the production of immunity to the rabic virus by vaccination. In this case the attentuated virus (which possibly is only a dilution) is obtained by exposing to sunlight and drying the virus in the spinal cord and brain of rabbits dead of rabies.

Owing to the long period of incubation of rabies, immunity may be produced, even after inoculation with the virus, by repeated vaccination with a vaccine of increasing virulence. This is contrary to the rule, vaccines in other cases requiring to be administered before inoculation with the virus to induce immunity.

The act of injecting the vaccine is termed vaccination. The injection of diphtheria antitoxin, or antitetanic serum, or of the Dorset-Niles serum and virus, does not constitute vaccination.

Anthrax Vaccine is now in common use in the anthrax-infected regions of the southern states, as well as in many other localities. The attenuation of the bacillus anthracis is accomplished by heat. A number of disastrous outbreaks of anthrax are reported to have resulted from the improper use of anthrax vaccine; and its use is considered not advisable except in the vicinity of actual outbreaks of this disease, when, if properly made, it is effective in controlling the same.

Blackleg Vaccine.—A greater number of doses of this vaccine have been administered than of any other kind except of smallpox vaccine. A larger number of doses of blackleg vaccine have been used than of all other vaccines employed in animals combined. It is doubtful whether any other therapeutic agent has saved to the live-stock interests of this country as much as this one preparation. Millions of doses of blackleg vaccine have been manufactured by the various biological firms, by the state experiment stations, and by the United States Department of Agriculture. This vaccine has been generally used in every cattle-growing section of our country in most cases by the stock-owners themselves. It is an almost certain preventive of blackleg, or quarter-ill, in cattle. Its saving to the cattle-producers has been almost incalculable.

Bacterin is the name applied to preparations containing dead bacteria. Bacterins introduced into the animal organism in many cases seem to stimulate the production of opsonins, which in turn facilitate phago-

cytosis, and in this or in some other way tend to produce an immunity against the organisms of the species of which the bacterins are made.

The following bacterins are at present in use to a greater or less extent:

Streptococcic bacterin, for the treatment of puerperal fever, erysipelas, scarlet-fever, strangles, cellulitis, abscess and other suppurating conditions.

Staphylococcic bacterin, for the treatment of furunculosis and other suppurating conditions.

Pneumococcic bacterin, for the treatment of pneumonia.

Pyocyaneus bacterin, for the treatment of suppurating conditions.

The Section on Pharmacology and Therapeutics of the American Medical Association not long ago appointed a committee to investigate and report on the use of bacterins. The committee's report was published in *The Journal of The American Medical Association* for January 22, 1910. The committee found that streptococcic and staphylococcic bacterins, when injected into rabbits, caused a rise in the opsonic index.

All four of these bacterins are used both in veterinary and in human medicine. The bacterins in common use in the practice of general medicine, but not in comparative medicine, are as follows:

Bacterin for Typhoid Fever.—This was used in the British Army in Africa during the Boer War, with the result that the per cent of deaths from typhoid fever among treated and untreated troops were in the relation of one to two; that is, 8 per cent of those receiving bacterin injections died of typhoid fever, while 16 per cent of those not injected died of the same disease. This shows a remarkable saving of life when we consider the prevalence of this disease among soldiers. The disadvantage of its application is the immediate production of a period of increased susceptibility lasting several days.

Neisser's Bacterin, for the treatment of gonorrhea, is used chiefly in the chronic cases, and particularly in cases affecting the articulations where its use has given exceedingly gratifying results.

Polyvalent Bacterin.—Two or more bacterins combined constitute a polyvalent bacterin. The pus-producing organisms are usually found together, i. e., most suppurating conditions are due to a mixed infection, and the different bacterins as noted above for suppurating conditions are frequently mixed, constituting polyvalent bacterins. The bacterins are all designed to produce active immunity, whereas the serums are intended for the production of passive immunity.

Autogenous Vaccine is a term applied to a bacterin made for a particular infection from the organisms causing that disease. Its function is not protective but curative. Its action is similar to that of other bacterins. Theoretically, autogenous bacterins are superior to stock-bacterins, but their advantages have not been proven in practice.

These bacterins are commonly called vaccines, and their application autogenic vaccination. Autogenic means "self-produced," and is, therefore, a name well applied to this product; but vaccine is a misnomer as here used.

Serums.—By serum as used in this connection, we refer to the serum or liquid portion of the blood of an animal that has been so treated as to develop in its organism some substance or substances that are antagonistic to micro-organisms or their products, or to other poisons or toxins. These antagonistic or protective substances may be antitoxins, antibodies, agglutinins, precipitins, antiferments, cytotoxins, opsonins, etc. They are each developed in the blood as a result of an effort on the part of the organism to protect itself. The process by which they are developed differs and is but little understood.

Many serums are now in use. Thus we have one for protection against strangles and other streptococcic infection; another for pneumonia; another one for rinder-pest; then the well-known Connoway, or B. A. I., serum for protection against hog-cholera; also many antitetanic serums which are valuable as preventives of lockjaw, but the effectiveness of which as a cure for tetanus is still open to serious question. To these must be added a serum for the treatment of canine distemper.

In human medicine there is the serum for dysentery that has reduced the deaths from that disease 6 per cent; another for gonorrhea, which is of less value than Neisser's bacterin; another for cancer, which is, perhaps, of less value than a bacterin made for the same disease; another one for snake bite; another for bubonic plague, which, though but slightly curative for this deadliest of pestilences, has a very marked protective power when given before the disease is contracted. Its usefulness in India, where the black death carries off hundreds of thousands every year, can hardly be estimated. There are in addition to these many other serums, but the greatest of them all is antidiphtheric serum which is said to save the lives of a hundred thousand children annually.

Many of the serums, or antiserums, usually are spoken of as antitoxins. There are, however, only four known kinds of bacteria that produce true toxins and for which the body produces definite antitoxins, viz., bacillus pyocyaneus, bacillus botulinus, bacillus tetani, and bacillus Klebs-Löffler.

An **Antitoxin** is a serum, ordinarily the liquid portion of the blood, that contains some substance or substances, the product of the animal body that neutralizes or overcomes the effect of toxins, or poisons—for a toxin, be it remembered, is a poison produced by microscopic plants or bacteria. Many of the higher plants likewise produce one or more substances poisonous to animals. Thus the nux vomica tree produces the poison strychnine; the tobacco plant produces nicotine. For either of these, strychnine or nicotine, the animal body will acquire a tolerance. Likewise, but probably in a very different manner, a tolerance is acquired for poisons produced by lower plants, or bacteria.

Immunity to bacterial diseases not due to antitoxins probably is due to bactericidal substances or to increased ability of the leucocytes to destroy invaders (opsonins). Antitoxins as prepared for use are ordinarily suspended in the serum in which they are produced.

Valuable serums of recent development are those for snake-bite poisoning. While of little importance in this country, where this affection is exceedingly rare, in some of the Asiatic countries, where the deaths due to snake-bite reaches the enormous number of 20,000 to 30,000 yearly, the value of an effective serum cannot be too highly appreciated. A disadvantage of these antivenom serums, or antivenins, as they are called, is the fact that each genus of poisonous reptile requires a specific antivenin, it being necessary to know the species of reptile inflicting the venom to decide what antivenin to use; besides the further fact that many venoms act quickly and the antivenin needs to be used very soon after the bite is received to be effective. Seven antivenins are now produced, a number of these are polyvalent.

Serums, or antitoxins, are produced by two different methods. First, by inoculating doses of the virus of a disease for which it is wished to produce an antitoxin, as is done in the manufacture of hog-cholera serum. Correctly speaking, this is a bactericidal serum and not an antitoxin. The other method consists in injecting into an animal increasing doses of the toxin produced by some disease-virus in artificial cultures. In this way diphtheria antitoxin is obtained. A short description of the production of these two antitoxins may be permitted here as illustrating the two general plans for the production of all antitoxins.

Serum for the Prevention of Hog Cholera.—To prepare this serum, a hog that is immune to cholera is used, usually one that has recovered from an attack of cholera being selected. This animal is given a hypodermic injection of virulent blood from an animal having an acute attack of hog-cholera. This immune hog will not sicken and die from this as would one not immune. He may show no ill effects from the injection of cholera virus, but his immunity increases. In a few days this hog is given another, much larger, dose of virulent blood, and a week or ten days later a still larger amount. The third dose may consist of as much as a quart of the most virulent blood obtainable.

The animal is now known as a hyperimmune, and his blood possesses such great bactericidal properties or properties antagonistic to the virus that produces hog-cholera that a small amount of it, one-half to two-thirds of an ounce, given a susceptible hog hypodermically will render that animal immune to cholera for a period varying from six weeks to longer. By inoculating the animal with a small amount of virus at the time of the injection of the serum this immunity will be sustained for life.

That this serum is an effective preventive of hog-cholera has been fully demonstrated. As yet the national and state experimental stations have been unable to supply the demand from infected regions for this serum. But it is possible to manufacture it in large quantities. Commercial firms no doubt will soon engage in its manufacture, in fact there are already two such concerns producing it.

It is possible that by proper co-operation among the several states and with the national government this disease may be eradicated from this

country and the enormous losses due to hog-cholera aggregating annually from $10,000,000 to possibly $50,000,000 may be saved to the live-stock industry and to the nation as a whole. A splendid achievement for a century, and yet the next decade may witness its accomplishment.

In the use of antidiphtheric serum, or diphtheria antitoxin, as in the production of smallpox vaccine, of tetanus antitoxin, and of some other prophylactic agents, the doctor of human medicine must depend for his product upon the skill of the veterinarian.

Diphtheria Antitoxin, like the other antiserums and the vaccines, represents a triumph of the bacteriologist. Much of a derogatory nature has been written concerning diphtheria antitoxin, but experimentally it is an almost infallible preventive, and used in reasonable time, a nearly certain cure for diphtheria; practically, notwithstanding the frequent misuse and delayed administration, notwithstanding the insufficient quantity frequently administered, it has reduced the mortality from diphtheria 75 percent, and is credited with saving the lives of fully one hundred thousand children annually.* Certainly an accomplishment of which bacteriology may justly be proud. To the faithful horse we owe no mean part in rescuing these one hundred thousand babies from untimely death, for it is the tissues of the horse that produce this antitoxin and blood of the horse that furnishes antidiphtheritic serum.

The charges that diphtheria antitoxin produces heart failure, collapse, paralysis and death have all been discredited. It is true, some undesirable features occasionally develop from its use, but they are only such as may develop from the use of normal horse-serum. The risk in its use is much less than that of the smallest surgical operation and can be entirely neglected in the presence of any real illness or even danger of infection.

For parts of the following description of the preparation of diphtheria antitoxin I am indebted to the H. K. Mulford Company who have issued a very interesting, instructive and readable pamphlet on the subject.

Pure cultures of the diphtheria, or Klebs-Lœffler, bacillus are grown in large flasks of bouillon in an incubating room for seven days. This produces great quantities of toxins. The germs are then destroyed by the addition of a mild antiseptic and the contents of the flask filtered to separate the toxin from the dead bacteria. The toxin is then standardized by the inoculation of graduated quantities into guinea pigs.

The next step in the preparation of antitoxin is the injection of the toxin into a horse selected for the purpose.

A hypodermic injection of the minimum lethal dose of toxin for a guinea pig is first given to the horse. This dose is gradually increased, and repeated about every four days for a period of six months. During

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*This statement is denied by many, including a considerable number of reputable physicians, who cite statistics that apparently contradict it. For example, in London prior to the use of diphtheria antitoxin, the number of yearly deaths from diphtheria per million inhabitants was 2571, while since the use of the antitoxin has become general, the annual number of deaths from this disease in England has been 3431, an increase of 40%. On the face of it, this makes a bad showing for the antitoxin. The serum is referred to by those opposed to its use as "the disease-promoting serum", and the deaths from diphtheria as due to "this terrible serum plague."

this time the horse's temperature and general health are carefully watched, and if the reaction to the toxin is too violent the dose is decreased, then subsequently increased as immunity becomes established.

The horse is not given diphtheria, since that disease can be produced only by the living diphtheria bacilli. He is injected with toxin from which all bacilli have been eliminated.

In accordance with the principles of immunity, the horse gradually acquires a tolerance (immunity) for the toxin and his blood develops antitoxin, the antidote to the diphtheria toxin. The potency of the antitoxin in the blood of the horse is increased and intensified by the injection of large amounts of toxin at short intervals.

After the horse has been treated for several months, and is able to resist large quantities of toxin, he is considered immune, a trial bleeding is made, and the definite antitoxic strength of his blood-serum determined.

The horse is used in the production of the serum for these reasons: He is comparatively free from disease, he enjoys a high degree of natural immunity to diphtheria, and he yields a fine quality of serum in considerable quantities.

The horse must be robust and in perfect health. Each horse is first injected with mallein, and is kept constantly immunized against tetanus with tetanus antitoxin. Many horses in perfect health are discarded because they do not produce antitoxin of required strength.

Trial bleedings are made from time to time. and when the horse's blood has sufficient antidiphtheric properties, from two to six quarts are drawn in a specially prepared operating room under the strictest aseptic precautions. The serum is then separated from the blood, its strength standardized by ascertaining its protective power for guinea pigs. A unit is the amount of antitoxin necessary to counteract the effect of one hundred times the minimum lethal dose for a 250-gram guinea pig.

Antidiphtheric serum has been used with a degree of success in veterinary practice in strangles and influenza.

Tuberculin and mallein are produced by artificial culture of the tubercle bacillus and the bacillus mallei, respectively, just as diphtheria toxin is produced when the Klebs-Lœffler bacillus is cultivated in the laboratory. Tuberculin and mallein, however, are not true toxins, but contain endotoxins, fatty acids and nucleinic acids. Some have claimed therapeutic properties for them, but they are not generally credited as being of any other than diagnostic value in veterinary practice.

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Gangrenous Stomatitis and Gastritis in a Dog—Spontaneous Recovery

By GEO. H. WOOLDRIDGE, F. R. C. V. S., M. R. I. A.

The patient was a mongrel Airedale terrier, male, about two years old. He would eat small quantities of food, consisting of flesh meat, and biscuits, sometimes dry and sometimes soaked, and as he never took much at a time, he was able to retain it. Frequently, however, during the day he would vomit a blackish liquid, very offensive in odor. He next began to dribble "black slimy stuff." Then diarrhea commenced, the feces being soft and yellow. The owner, an intelligent boy, thought that the illness was probably due to worms, and so "worm medicine" (areca nut) was administered, but no worms were seen either before or after the dose. A week before being brought in to the clinique, while the dog was being fed on some fresh red beef he spat out "a dirty yellow bit of flesh, thin and doubled up." Since then he had fed better and got brighter in manner. The boy was not satisfied with him, however, because he remained thin and behaved in a peculiar manner when given water, appearing to "bite at it instead of lapping it." The above is the clear and lucid history as given by the boy, some of his own words being used.

On examining the dog I found him to be quite bright, but thin and rather weak, in fact, when he jumped from a comparatively low table his legs collapsed under him, but he immediately regained his feet. There was no discharge from his eyes, and the color of his conjunctiva was normal. On opening his mouth the cause of his inability to lap water was immediately visible. He had lost the whole of the foreportion of his tongue right back to the *frænum linguæ*. No doubt this was the "dirty yellow bit of flesh" of which the boy had spoken. The wound of the stump of the tongue looked to be healing nicely, and there was now no offensive odor. The dog has not vomited for almost a week, and his appetite is improving. His temperature was 102.2° F. I offered the dog water, and the boy's description of the dog's method of trying to drink was shown to be quite correct. It took him a very long time to get even a small amount, and, of course, he got it more easily from a deep basin than from a shallow one.

I prescribed a little tonic medicine and a mild collutorium, and gave instructions as to feeding and providing water in a deep basin. The dog is now thriving well, and is learning to suck water. He is much stronger, and is rapidly gaining flesh, and the wound of the tongue is quite healed.

I am prompted to record this case to show how spontaneous recovery may occur in some cases of very serious disease. This dog was affected with a disease closely simulating the so-called "Stuttgart dog disease," which is undoubtedly fatal in a very large proportion of cases where the necrotic mouth lesion occurs. This dog, at any rate, had not had his natural recuperative powers reduced by the administration of nauseous drugs. Of course it must be remembered also that the patient was a

young dog (estimated at 2 years old) and a mongrel, both points, which, in my experience of this disease, assuming it to have been Stuttgart disease, were enormously in his favor. On the other hand, I do not wish to detract from the beneficial effects that may be obtained from the judicious use of various drugs, but I do wish to emphasize that careful nursing is the all-important item of treatment, and that medicines are often worse than useless, especially if the patient fights against them.

In the general treatment of Stuttgart disease the drugs I most frequently rely upon are carbonate of bismuth and salol, the former as a gastric sedative to assist retention of small quantities of liquid food, and the latter as a general internal antiseptic. These drugs I alternate with brandy in milk. Mouth lesions I dress with iodine solutions and boracic mouth washes. From all accounts my results would appear to be rather more favorable than those obtained by many practitioners, but that may be due largely to the fact that a fair proportion of my patients are crossbreds, and probably possessed of more than average stamina.—*Veterinary Journal*, London.

Impaction of the Colon in Horses*

By I. E. NEWSOM, Ft. Collins, Colorado, Professor of Anatomy, Colorado Agricultural College

I believe that fully one-half of all the cases of colic that we treat in the alfalfa districts are impactions of the colon. I am quite sure that two out of every three cases treated at Fort Collins, Colorado, would be given that name if properly diagnosed.

The farmers speak of horses in this condition as being "plugged," and certainly this expresses the condition about as forcefully as one could desire, for there is nothing less than a large, unyielding "plug" sometimes nearly as large as a man's head, and usually found in the floating colon. Only occasionally have we found one located at the termination of the large colon. Rarely is the obstruction near enough to the rectum to be removed by the hand.

Straw or alfalfa—more often the latter is usually responsible for impaction of the colon. Alfalfa hay that has been improperly cured, or scattered in the fields and become bleached, is probably the most common cause, but green alfalfa, strange as it may seem, is responsible for many obstinate cases.

Usually there is but one mass causing the impaction, but sometimes the autopsy reveals two or three. Defective teeth, lack of water, lack of exercise and torpidity of the bowels are predisposing factors.

Quite frequently horses will develop impaction when turned into alfalfa fields early in the spring. Impaction in this case would seem improbable, but is sometimes explained by the fact that it is the old last year's stubble which causes the trouble and not the young plants.

*Read at annual meeting of the Missouri Valley Veterinary Association, Omaha, Neb., July 6-7, 1910.

The symptoms are doubtless familiar to all of you, but they frequently present some peculiarities which will mislead the practitioner if not carefully observed. For instance, diarrhea is not uncommon and misleads the unwary. Too often the practitioner gives an anodyne and an intestinal astringent, only to find later that in reality the case called for active purgatives because of an impaction. However, the diarrhea is in evidence for only a few hours, and the evacuations are never copious. I regard this diarrhea as the result of an effort on the part of nature to remove the impacted mass, but is successful in removing only such feces as are within the bowel posterior to the obstruction.

The presence of flatulence and a rise of temperature may mislead the diagnostician but since these are present only in the later stages, they should not confuse the experienced practitioner. The flatulence is the most troublesome symptom since it practically inhibits manual examination through the rectum.

To diagnose a case as impaction solely because peristalsis is absent, or nearly so, would be a mistake, for in the earlier stages peristalsis is quite active, as is evidenced by the diarrhea, and by auscultation of the abdomen. The pain is seldom severe, and the violent symptoms of spasmodic colic are absent. There is usually pawing, uneasiness and an anxious countenance.

The diagnosis is not always easy. Both the history and symptoms are misleading. I am never satisfied to diagnose a case of colic, no matter how mild or how severe, without a most thorough rectal examination. A rectal examination, is to most practitioners a disagreeable task and many cases are never properly diagnosed for the lack of it. First of all the examination tells me if the rectum is empty, and if it is, other symptoms being right, I begin to suspect impaction because in so many of these cases the rectum has been emptied, and in fact the whole floating colon back of the obstruction, before the animal evinces any uneasiness. In more than half of the cases I have observed, the impacted mass can be located, thus rendering the diagnosis certain.

Consequently I repeat and I say this after nearly nine years' experience, *always make a rectal examination in every case of colic.*

As to treatment. I have nothing new to offer, and must confess that I am something of an old "fogy" after having tried about everything known to man, with varying success. This thing should be remembered that a case of impaction may nearly always be counted on to live for several days without treatment other than controlling the flatulence with a trocar. I have known them to live ten days with treatment, and that is doing pretty well for most treatments kill them before that time. Anodynes are not usually necessary, but where pain is severe, two grains of morphine may be given hypodermically. Chloral or cannabis is not objectionable. I doubt if the constipating effect sometimes attributed to these drugs, really does any harm. The greatest disadvantage in their administration is that they mask the symptoms. As to eserine, arecoline, and barium

chloride, I will say that after conscientious trial and after watching the other four veterinarians with whom I am associated use them, I feel that no matter what the dose they are contraindicated in the first twelve or possibly twenty hours. Their only effect is to increase the pain and flatulence, and hasten death.

Occasionally after heroic doses of these drugs have been given, the autopsy reveals a second or even a third ring of strangulated bowel, showing that the mass was moved a few inches, but seldom indeed have I seen the obstruction removed entirely. The question here arises, as it always does in therapeutics, could these cases have been saved by any other treatment? I believe that some of them could.

After the mass has been loosened by other agents these will nearly always expel it, but even then I do not think they are necessary. They do hasten a favorable termination, but the softening and loosening of the mass is the important thing and when this is accomplished with oil or salts or even manual pressure through the walls of the rectum the obstruction will be expelled without further interference. This will often require from twenty-four to forty-eight hours to soften or loosen the impacted mass and if eserine, arecoline or barium chloride are to be used at all, then is the time, but the case has already been saved without them. I must say that I have not witnessed much benefit from rectal injections in cases of impaction.

Many cases are cured by crushing the mass between the hand, the abdominal wall or anterior border of the pubis. Sometimes the mass is so hard that it can not be broken up in this way.

The treatment which has given me the most satisfaction in treating impaction is as follows: Give of raw linseed oil, at least a quart, with fluid extract of nux vomica, two to four drams (It may be that Reek's dose would be better, but I have always been afraid of it), some aromatic spirits of ammonia or turpentine, one to two ounces to control fermentation and as a stimulant. In from six to eight hours later I give a pound of either epsom or glauber's salts with aromatic ammonia and nux vomica. I repeat these doses later if necessary, or until the pain ceases. Of course I sometimes resort to the trocar and occasionally give strychnine, atropine and digitalin hypodermically or pass the stomach tube to relieve gastric flatulence.

I do not know how much oil a horse can safely take when in this condition, but I have known them to get more than two gallons without serious purgation following.

I presume I lose as many cases of impaction as most of you do, but of one thing I am sure—I do not lose as many as I did before adopting this line of treatment.

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Tetanus*

By DR. PETER BAHNSEN, Veterinarian, Department of Agriculture, State of Georgia

The presentation of a paper on Tetanus before an association some of whose members are credited with constant recoveries from this dread malady in from 75 to 90 percent of their cases seems, indeed, presumptuous, by one who, in the interest of truth and candor, must admit his personal experience to have been a serial succession of fond hopes and dismal failures. This paper was born neither in the hope of advancing any new and unheard-of theory nor in resentment of the flattering reports which, of late, have crammed the pages of professional and semiprofessional —or rather commercial-professional veterinary literature; but its aim is to stimulate sane, unbiased reflection as regards the therapeusis of this horrible affliction, instead of basking in contentment upon the foamy laurels of untried neophytes, or the glittering endorsement of an occasional enthusiast. Right here I want to emphatically disclaim any intention of personal reflection toward anyone, even should their published reports fall under the hammer of my criticism.

In addressing a paper on tetanus to this body I am sure it is superfluous to dwell upon definition, history and etiology of the disease-producing factor, these subjects are familiar to all present; and then, it is especially the practical phase of the subject which I wish to call to your attention.

A brief *resumé* of the pathogenesis of the tetanus bacillus will aid in getting the subject clearly before us.

First. Fresh cultures, from two to five days old are only mildly toxic, the toxicity of the culture increasing progressively with its age.

Second. Long-continued washing of extremely toxic cultures deprives the spores of their toxin, and thus prepared even large doses prove harmless when injected into susceptible animals. Excessive, continued heat (80° C., or 176° F.) also destroys the toxicity of the culture without destroying the spores. Yet, these cultures harmless, or nearly so, within themselves when injected into a bruised region or accompanied by grit, dust or foreign bodies, or when introduced into a region previously injected with a negative chemotactic fluid, such as lactic acid, invariably regain their virulence and produce the disease.

Third. The toxins, no doubt, represent a specific secretion of the bacillus. It is soluble in water and insoluble in alcohol, chloroform and ether, and is extremely poisonous. One Cc. of the filtrate of a highly virulent culture is capable of killing a 1000-pound horse. Other animals require relatively larger toxic doses.

Fourth. The action of the toxins is manifest only when injected subcutaneous, intramuscular, intravenous (?) or intracerebral; even arge doses administered by way of the digestive tract proving absolutely harmless. (Hutyra & Marek.)

*Read before the Alabama Veterinary Medical Ass'n at its 3rd annual session held in Montgomery, Ala., July 20-21, 1910.

Admittedly tetanus is not primarily the result of an infection with the ladle-shaped bacillus of Nicolayer but the characteristic symptoms are the consequence of an intoxication; the nervous system shows a strong selective affinity for the toxins eliminated from the constantly sporulating bacillus.

The intensity of this intoxication is regulated by the same fundamental laws which govern the development of an infectious attack. Briefly stated these factors are:—the variable susceptibility of the affected individual, the virulence of the invading organism—to which, in case of intoxication, the strength of the destructive toxins should be considered—, and the condition of the atrium of infection—which may be either favorable or unfavorable to the development of the invading microorganism. A careful consideration of these conditions enables the practitioner to prognosticate, with reasonable certainty, the outcome of almost any attack; the errors in a prognosis thus founded is invariably due to baseless presumption as regards the period of incubation—but of this more later.

The soil, particularly soil which is strongly permeated with manure, stands convicted of being the commonest source of infection. We therefore find tetanus a frequent sequela of wounds which offer the greatest opportunity for soil contamination. Being obligative anaerobic, deep penetrating infections offer a more favorable development for the tetanus bacillus than do more open ones; this accounts for the preponderance of cases following such injuries as deep penetrating wounds to the lower parts of the limbs, castrations—especially where clamps are used, and penetrating wounds on the ventral body surface. Not infrequently our most painstaken examination is without result, the atrium of infection is closed, the site of infection cannot be located—a cryptogenetic infection exists.

The pathogenic action of the bacillus is not manifest immediately upon its introduction into the animal. This lapse of time constitutes the period of incubation. Its length, depends upon the conditions previously named—i. e., susceptibility of the individual, virulency of the invading organism and favorable or unfavorable conditions for its development at the site of infection. The period of incubation varies from twenty-four hours to three or four weeks. Such variable development cannot be, and is not, without significance as to the outcome of an attack; however, the possibility of a secondary infection, subsequent to the date of first injury, must not be overlooked. Neglecting this possibility may lead to an erroneous deduction. Not only do these factors sway the pendulum between certain death and ultimate recovery, but they also form the paramount consideration as regards the period of convalescence in case of recovery.

No doubt some will say: "How about our treatment?" "Have you ever tried—this, or that, or something else?" Well, if I were addressing an assembly of my patrons who had entrusted me with the care of their lock-jaw cases during the past 18 years, I doubt having the courage to own

up to my many trials, to the times—when at their expense—I have hoped though defeat and failure were the only result in reason to expect; to say nothing of the many times when I myself, spurred by the fire of enthusiasm, expected flattering results from a line of treatment because it came endorsed by those who are acknowledged leaders of undoubted ability and unquestioned integrity,—only to enlarge my store of disappointments.

How easy it is to come to an empirical conclusion in regard to our treatment. Accepting a few successful terminations as the result of our treatment is much like casting bouquets at one's own ability, and to use the expression of the Irish maid: "We love to talk about it!"

Any well read Veterinarian can recall the succession of flattering reports which have lighted up the pages of veterinary journals, and even text books, filled them with new hope only to find it a bubble, a delusion. And yet, I firmly believe that in all cases the records are correct—the recoveries have occurred; but, and therein lies the pinch, the natural tendency toward recovery has been completely overlooked. Many cases die annually as a result of ill-advised and indiscreet treatment that might have recovered if let alone.

Who among the older practitioners has not tried cannabis indica on the strength of Mr. Richard Rutherford's experience—quoted in Finlay Dunn's Veterinary Medicine; or, gelsemium at the suggestion of Dr. W. L. Zuill—published in his translation of Friedberger and Froehner; or, with Cadiot tried sodium sulphate and bicarbonate in large and continued doses. Did not the carbolic-acid treatment—a la Bacelli—receive unstinted praise at the hands of both the veterinary and the medical professions? All veterinary literature, foreign as well as American, resounded with eloquence the curative virtues of phenol solutions, as to failures—well they never made good reading consequently few were reported. I shall not attempt to enumerate all the drugs that have, first and last, been endorsed as "gilt-edged" in the treatment of tetanus: Lugols solution intratracheally; oxygenated water intravenously; cholesterine hypodermatically; orally curare and potassium bromide; chloral hydrate both orally and in rectal injections; atropine, morphine, pilocarpine and arecoline; I even find Tallianine among the list that has been tried and endorsed.

Operative surgery has been advanced to fill the wants of a certain and effective panacea. Neurectomy, in cases of tetanus resulting from injuries to the hoof, has been endorsed by Rosco who claimed recovery as a result of his operation.

Depleting the patient by venesection, both with and without additional treatment has been endorsed. Thus "Habicht drew 9 liters of blood every fourth day, injected iodipin 25 percent every following day and rested every third day"—two straight recoveries. Crinon extracted 10 liters and repeated after three days, then 10 Cc. antitoxin and 120 grams of Bromkali for four days—recovery in two weeks. Dumas duplicated this feat.

But the most flattering surgical cure emanated from the pen of a Winterset, Iowa, M. D. Honest injun like, he confessed that his was but

an improvement over the procedure of a Mr. Miller who merely knocked the patient in the head and fractured his skull, even this crude method led to certain recovery. The story was so good it jarred my think-pan, and I assisted four tetanus patients to "lie down with patriarchs of the equine world" according to the formula of Wilbur Fiske Sterman. Other veterinarians who have tried it have told me of equal results; yet, the Editor of CLINICAL MEDICINE, in August number, 1909, says: "We have received a number of very interesting favorable reports from veterinarians concerning the Sterman operation upon horses suffering from tetanus. In one horse operated upon in this city, however, the *method seemed to be an entire failure.*"

Says Dr. Sterman in his article (April, 1909, CLINICAL MEDICINE): "I refer to the peculiar gas formation with the toxins, both primarily and secondarily. This gas is present everywhere, from the beginning of toxin-formation, is intensely irritating to the nerves even at the seat of inoculation, etc."

Really, I must confess that in more than two hundred cases that have come under my observation this gas production has not been observed; nor do I recall a similar recorded observation in any veterinary literature at my command (excepting the reference to this matter in Vol. 2 of Merrilat's Surgery, page 447). "Brunner in 1898 proved that gaseous changes are notably active from the very period of incubation." I am inclined to the opinion that in those cases where gas-production at the point of infection is manifest it is due to the simultaneous infection of the wound with the bacillus Oedematis maligni. And, as regards the irritating effects at the seat of inoculation my observations have been exactly to the contrary. Animals showing distinct lameness and intense pain, as the result of an injury, prior to the development of the general symptoms of tetanus invariably show less lameness after. I look upon the complete suppression of pain, in such a case, at the site of inoculation as an almost certain indication of a fatal attack. (Of course, intense rigidity naturally modifies any manifest symptoms of lameness—mechanically.)

Dr. Sterman admits that: "The equine race is the one most frequently affected, and my experimental work has been with it. A horse may be very dangerous in the violent throes of tetanic convulsions, but when the skull is opened, and the gas escapes with a hiss, the horse quickly regains his feet, soon nickers for something to eat and soon eats it, and the trouble is ended then and there."

How simple; how marvelous; how certain, if it were only true. If I appear in the *role* of an iconoclast it is with the hope that when our present illusions concerning the cure of tetanus have been removed a more successful line of therapeutics will be introduced; with this apology I will review the claims and the virtues of tetanus antitoxin serum. As all of you know, within the last few months a general revision of the strength or rather standardization of commercial veterinary antitoxin has taken place. This did not occur without the usual presentation of both sides to the controversy; I will call your attention to the statement of Dr. T. B. Rogers

of Woodbury, N. J. (chief veterinarian for the H. K. Mulford Company), who states (*Missouri Valley Veterinary Bulletin*, May, 1909), "A great many of those horses are in a tetanus district, and before that method (immunization with antitetanic serum) was instituted many cases occurred. In the six years this method has been followed, we have never had a death from tetanus and we are giving a serum that did not read over 500 American units." The author argues *with good reason*—if 500 units are sufficient for protection why increase the cost of treatment by injecting 1500.

As a prophylactic the value of antitetanic serum can hardly be questioned, the only question involved is the size of the dose necessary to effect immunity. Of course cases are on record where animals developed tetanus after receiving an immunizing dose of the serum, this may have been due to a special susceptibility of the animal so injected, or to an inferior product of antitetanic serum, either or both. Universally, however, the serum has, as a prophylactic, secured the endorsement of the general practitioner; not so with the larger, so called "curative doses." It is true a good many cures (?) have been reported, but a careful study of those cases that give a complete anamnesis show that they were the class of patients that naturally had a fair chance to recover.

Right here I want to assert that, in my opinion, meteorological conditions have a certain influence upon the severity of the disease. To illustrate: In 1908 I lost only two out of seventeen cases of tetanus, yet under similar treatment I was forced to haul five patients in rapid succession to the crematory in 1909 (two of these cases were trephined) and then, taking new hope in large doses of antitetanic serum, three more followed at an enormous expense to the owner. This made a total of eight fatal terminations out of eleven cases in 1909. The latter part of 1908 I was eager to treat tetanus patients, one year later I studiously avoided any case that looked unfavorable to me. It is needless to say I have predicted fatal results and seen recoveries, and have held out hope of recovery and had my patient die. I have seen recoveries of well-developed cases under the most unfavorable circumstances, and absolutely without treatment.

Practically the curative doses of antitetanic serum have not been successful, neither in my hands nor in the practice of professional colleagues, of my personal acquaintance, though they annually treat very many cases.

And our record stands by no means isolated.

According to the "Statistical Veterinary Sanitary Report of the Prussian Army (Anno 1906)" forty-nine horses suffered from tetanus and seventy percent died. Out of ten treated with tetanus antitoxin eight died, and in two cases it even failed as a prophylactic. Anno 1907 of the same report records forty-five cases with nine percent or four recoveries to ninety-one percent fatal termination. Again the report states "Medical treatment as well as antitoxin injections were without result." Again in 1908 forty-five were affected with tetanus eight recovered, and thirty-seven died, a loss of approximately eighty-two percent. Again we find in this report:

"Injections of antitoxin had no influence on the progress of the disease."

Dieudonné and Chapellier, two French veterinarians, in separate articles, recorded in the *Recueil de Médicine Vetérinaire* 1909, laud the value of immunizing doses of antitoxin but deny any virtue to the curative claims for this preparation.

Pochhammer, in a very elaborate report *Experimentelle Untersuchungen ueber the Entstehung des Starrkrampfes und die Wirkung des Tetanustoxins im menschlichen und tierischen Organismus*, (published in *Volkmann's Sammlung Klinischer Vortraege*, 1909) comes to the following final conclusions:

The toxins hidden and fixed in the nervous system are not affected by the antitoxins.

Serum injections are therefor useless in well-developed tetanus.

The value of prophylactic injection is, at least, doubtful.

Even in actively high-immunized animals fatal tetanus results from continued injection of toxin in small doses, since parts of the toxins are taken up by the nervous system and accumulate there.

In the *Medical World* Dr. J. C. Dreher gives the details of two cases of tetanus treated successfully with physostigmine, a third case sent to a hospital and treated with antitoxin died. In fact medical literature is rather barren of reports of successful treatment of tetanus with antitoxin. Why is it?

The Temperature of a Pregnant Cow

By C. W. PURCELL, V. S., Biddeford, Maine

It has often been said and seldom denied, that the temperature of a cow in the latter stages of gestation and her condition, forbids the application of the tuberculin test.

Some years ago, when we commenced testing extensively in this state, it was often said to me, that such and such a cow, was not a fit subject for the test, because she was so near to calving or was due to calve.

In a large majority of cases, I was able to overcome the scruples of the owner, so that today, it is not offered as an objection as freely as formerly.

During the last five years I have been keeping records of such cases, and now offer this record for the benefit of others, many of whom may have entertained the same doubts in the matter.

Out of 16,500 tested, 1738 have been either within five days of calving, or overdue.

Of these 1738—

1403 were not above 102° F. as a normal.
172 were between 102° F. and 102.4°F.
109 were between 102.4 °F. and 103° F.
54 were above 103° F.

Out of these 1,738, fifty-three, reacted, were destroyed and showed evidence of tuberculosis at postmorten examination.

The weak point of my records is that I did not keep track of the 53 cows that had a normal temperature above 103 as to whether they reacted or not; but speaking from memory, they were not more numerous as reactors than those of the lower normal temperatures.

I would say, that of these 16,500, nearly 3000 were tested annually, so that the percentage of disease among them was very small.

Two cases of interest. One a cow that had ruptured the water bag when I took the first temperature, and the other a cow that had the forelegs of the fetus presented when the test was commenced; both were below 102.2° F. and were injected. Next day, neither rose above 102.4 °F. Both have been tested twice since and have never reacted, so that I have reason to believe that the test made at the time of calving, was a good test. I believed it at the time and the two subsequent tests have only confirmed my opinion.

One case of a cow suffering from a mild case of indigestion, with a normal of 103.4° F., was injected, and the highest point reached the next day, was 103.2° F.

She has been tested twice since, and is sound. I do not recommend testing these cases; but if you leave them, you know nothing about them and if you inject them; perhaps you don't.

Still, when you test the same animal, year after year, and prove your first test, you will be apt to feel as I do; that advanced pregnancy and slight ailments, are no bar to the successful use of the tuberculin test.

That even if you have a normal temperature as high as 103° F., you are bound to get a rise in a tuberculous cow. There may be cases where a cow is so badly diseased that you get (as the saying is) no reaction; but in my experience, they are so rare, that they are not worth considering, and when they occur, a competent man will always condemn them without the reaction.

I am of the opinion that many such cases are not tuberculous.

As bright a cow man as I ever knew, and a human physician of known ability, bought a pure bred heifer, six months old, that had been immunized against tuberculosis, and kept her until she was three years old, trying to get her with calf all this time. With the rest of the herd, I tested her when she was one year, two years and three years old and she never reacted.

He tried all ways of getting her with calf and failed and sent her to the butcher. Now, this man was no novice. He knows cows from "A" to "Z", and he knows the tuberculin test as well. His herd was tested at the expense of the state, yearly, so that he never touched it.

At the postmortem, he found the mediastinal glands, thoroughly diseased, full of inspissated pus, calcareous material and as large as your two fists.

He wrote me that he had a bone to pick and one that would surprise me and the rest. He had formulated a theory, that the immunizing serum

did not protect the animal against tuberculosis, but did prevent a reaction to tuberculin. He had always been present at the testing of the herd and was satisfied that the tests had been carefully carried out.

However, he was not satisfied to rely upon his own judgment (and if I had seen the case, I am satisfied that I would have pronounced it tuberculosis), but sent the diseased glands to Bowdoin College for bacteriological examination. They examined the material and reported that, while it had all the ear marks, it was not a case of tuberculosis, and that settled it. Now, my point is, that many cases are called tuberculosis, that are not tuberculosis. There were several quite experts, that were fooled on this case, until it came to a final decision.

When you get to a physical examination, I have a case in mind, in a very high-priced animal that reacted to the tuberculin test, was put away by herself for seven years, dropped a calf each year (all calves were tested several times and proved sound); but at the end of that time, she commenced to fail in health. Not being able to get her with calf, the owner decided to let her go and put the case up to me.

I tested her and she gave a typical reaction, and she was a case of advanced tuberculosis (physically) if you ever saw one, both to me and to the owner (who is an expert), and to the manager of the herd.

At the postmortem examination nothing was found about her to show the disease in the slightest degree.

Here are a few thoughts worth chewing over. One is, does advanced pregnancy interfere with the tuberculin test? I think that it does not.

The other, can you be always sure of a case of tuberculosis, without a try out by the bacteriologist? Again I think not.

—

[We have on several occasions tested cows on the very day of parturition with accurate results and cases where a satisfactory test was made very near the date of calving are numerous. From our own experience we believe that advanced pregnancy does not preclude accurate results from the tuberculin test. Does a cow in the last stages of tuberculosis fail to react to the tuberculin test? In our own experience they have not failed to react when tuberculous no matter how advanced the disease. On one or two occasions from physical examination we have pronounced cows, in advanced stages of tuberculosis when the tuberculin test had not indicated them diseased. Subsequent examination demonstrated that tuberculin is a more accurate diagnostic agent than percussion and auscultation when conducted by us. What say others? Is there any truth in the statement that cows in advanced stages of tuberculosis do not react to tuberculin?—ED.]

American Journal of

Veterinary Medicine

(FORMERLY THE MISSOURI VALLEY VETERINARY BULLETIN, TOPEKA, KANSAS.)

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ADDRESS,

D. M. CAMPBELL,
1926 WILSON AVE., CHICAGO, ILLINOIS.

A National Department of Health

It is reported in the daily press that President Taft will in his first message to the next congress recommend the passage of the Owen Health Bill.

This bill as perhaps all of our readers know, was introduced at the last session of congress but failed to come to a vote. The bill provides for an amalgamation of all Bureaus and Divisions of the various Federal Departments in any way related to health and hygiene, into a single department, whose head shall be a cabinet officer. The Bureau of Animal Industry, at present a part of the Department of Agriculture, will become a part of the Department of Health if the Owen Bill in its present form is enacted.

There can be no question that a National Department of Health is a much-needed division of the Government, or that it will be provided for at no very distant time, either by the Owen Bill or by similar legislations.

Modern science and preventative medicine have opened up great life-giving possibilities. Their realization depends upon concerted action on a uniform system under a strong executive head such as only the general Government can supply.

Notwithstanding the laudable purpose of this bill—the lessening of sickness, disease and death—it has met with much opposition. During

the past summer an active organization has been addressing arguments opposed to the Owen Bill directly to the public through the daily press, through magazines and by means of circulars. They charge that the bill was drafted in the interest of the leading school of practice and to crush all others and that the proposed Department of Health will be dominated by the American Medical Association and a great medical trust will thus be built up. The supporters of the measure disclaim any sinister motives and charge that the opposition to the formation of the Department of Health was inspired and financed by a combination of patent-medicine advertisers, quacks, mental healers, faith healers, Christian-Science practitioners, and other irregulars who profit by ignorance and lax health regulations.

The public and public officials have accepted a considerable part of both charges as being true; an unfortunate circumstance, because to take an active part now in either supporting the Owen Bill or in opposing it, is to be placed in the minds of many, either among those who favor a great medical trust and the crushing of the smaller sects or as one who profits by ignorance and disease and is opposed to strict health regulations.

Whether or not this classification is just as applied to the medical profession, veterinarians may honestly oppose parts of the Owen Bill without either sympathizing with or having a desire to aid the organized opposition to the bill. Many veterinarians are opposed to the transference of Bureau of Animal Industry to the Department of Health, believing that the merits of Veterinary Inspectors and the worth of the Veterinary Profession will be more appreciated by a lay department head than by a department head that is of the medical profession. However, this may be, we believe the publication by certain of our veterinary periodicals, of articles unqualifiedly opposing the Owen Bill and the passage of similar resolutions by a number of veterinary organizations to have been ill-advised. It subjects the profession to the charge of profiting by the existing lax health regulations and as favoring their continuance.

Opposition to any measure, to have weight with a legislator should state succinctly what is opposed and the reasons for the opposition. We believe the veterinary profession as a whole favors the establishment of a Department of Health as a part of the national government. We believe it opposes that part of the Owen Bill which provides that the Bureau of Animal Industry shall become a part of the Department of Health because the activities of the Bureau of Animal Industry cover a much wider field than the inspection of food from animal sources. Its control of the interstate movement of live stock and its work in the eradication of diseases of animals bear a close relation to the agriculture of the country and should be under the direction of the Agricultural Department. The necessity of tracing disease from the killing floors of the packing houses back to its source on the farm makes it advantageous for the same department to have charge both of the eradication of disease among animals and postmortem inspection of slaughtered animals. Attempts at the control or eradication

of infectious diseases among animals must ever require varying numbers of veterinarians as the diseases receiving consideration increase or decrease in prevalence. This makes it advisable that the Bureau of Animal Industry employ a large number of veterinarians, that an organized force may always be ready to cope with emergencies when they occur. If this force of veterinarians be employed at all times it is a matter of economy to employ them in meat inspection when there is no extensive outbreaks of infectious diseases to combat.

The San Francisco A. V. M. A. Meeting

The forty-seventh annual meeting of the American Veterinary Medical Association held in San Francisco on the sixth to ninth of the present month was a disappointment in point of attendance but a great success in every other way. In the quality of program rendered and in the excellence of entertainment for visiting veterinarians the San Francisco meeting has never been excelled. That the attendance was light is chargeable solely to the veterinarians of the eastern and central states.

The total registration as published on the third day of the meeting contained the names of less than 200 veterinarians, of whom considerably more than one-half are Californians.

Dr. Geo. H. Glover, head of the Department of Veterinary Science of the Colorado Agricultural College, Fort Collins, Colorado, was elected president. Dr. C. J. Marshall of the Univeristy of Pennsylvania, School of Veterinary Medicine, Philadelphia, was elected secretary. Dr. Geo. R. White, Nashville, Tenn., and Dr. W. L. Williams, Cornell University, Ithaca, N. Y., were reelected treasurer and librarian, respectively.

Soothes and Disinfects the Intestinal Canal in Bacillosis

I have had several cases in colts, of what Dr. L. van Es terms bacillosis. I will not go into the pathology. My treatment consists in first cleaning out the intestinal tract with castor oil followed up with:

Bismuth subnitrate. . . . . 30 grs.
Salol . . . . . 15 grs.
M. ft. chart. No. 1

Sig. Give one powder every six hours until evacuations become checked. It usually takes about four powders. I also give 1-2 ounce of 1-4000 formalin solution in 1-2 pint of coffee every six hours, till four doses have been given. After a couple of days, I repeat the castor oil.

F. R. S., D. V. M.

Batavia, O.

[This is treating the conditions presented and it appears your results justify the treatment; but we believe calomel and cascarin, aloin or podophyllin will give better satisfaction than castor oil for the cathartic, and, in the sulphocarbolates of zinc and sodium, we have a somewhat more efficient

intestinal antiseptic than salol and at the same time avoid its systemic effect. For the general stimulant we should choose strychnine as more dependable than coffee.

The essential thing is to keep clearly in mind the clinical picture in these severe diarrheas of the young. The distressing and depleting diarrhea, indicating the system is endeavoring to rid itself of an irritant; the stinking feces indicating putrefaction of the intestinal contents; the prostration indicating autointoxication. The indications are clear—cathartics to remove the irritant; antiseptic to inhibit further fermentation or putrefaction, and supportive measure to tide the little patient over till it can digest some food.—ED.]

Value in the Advertising Section

It is admitted of course that our advertising pages are a valuable part of the *Journal*, constituting as they do a directory of reliable firms from which to purchase supplies for it goes without saying that you do not want to place your business with a firm that is too dead to advertise or one that is not reliable and cannot get its announcement into a reputable publication.

But aside from their value in making purchases our advertising pages are worth your careful perusal. Every thing new in medicine or surgery is first listed and described there. Every advance in biologics; in disinfectants; in standardization of drugs, or in therapeutic methods; every new instrument or other accessory of practice is first of all illustrated and described in the advertising section. The advertisements in this Journal should be read for the information they contain by every one who would keep abreast of his profession, though he has no thought of immediately purchasing any of the products advertised.

Renewals

Several hundred subscriptions to the JOURNAL expire with each issue. All subscribers are promptly notified by letter of the expiration of their subscription and their renewal solicited. Most of them renew at once, but the others—they are the ones that try our patience. They wait about six weeks—till the next issue has been mailed and the extra copies sent out as samples to acquaint other veterinarians with the good points of our publication—then in come their renewals and requests for the missing copy. If we can't supply it they say all manner of hard things about us and all because they have themselves failed to renew their subscriptions when they should.

Speaking of sample copies impels us to say if this is a sample copy to you please consider it an invitation to subscribe and a notice that if you do not now subscribe you will not receive another sample copy—at least not for several months. We send out a few sample copies each month but we cannot afford to send them twice to the same veterinarians. The cost of sampling is heavy and if a veterinarian is not convinced by

reading one number that he cannot better invest a dollar, than to secure a year's subscription the chances are he would not subscribe were he invited every month.

Experiment Station Publications

Experiment station publications of interest to veterinarians published during the past month are as follows:

Rabies. (Circular 9, Kansas Agricultural Experiment Station, Manhattan Kansas.)

Biography of Koch. (Editorial Experiment Station Record, August, 1910. U. S. Department of Agriculture.)

The Care of New-Born Foal. (Circular 13, Wisconsin Agricultural Experiment Station, Madison, Wisconsin.)

Animal Experimentation: The Protection it Affords to Animals Themselves and Its Value to the Live Stock Industry of the Country. (*Journal American Medical Association*, Vol. 54, No. 11.)

The Regeneration of the Morgan Horse. (Circular 163, Bureau of Animal Industry.)

Some Important Factors in the Production of Sanitary Milk. (Circular 142, Bureau of Animal Industry.)

Milk and Its Products as Carriers of Tuberculosis Infection. (Circular 143, Bureau of Animal Industry.)

Improved Methods for the Production of Market Milk by Ordinary Dairies. (Circular 158, Bureau of Animal Industry.)

Regulations of the Secretary of Agriculture Governing the Inspection, Disinfection, Certification, Treatment, Handling, and Method and Manner of Delivery and Shipment of Live Stock which is the Subject of Interstate Commerce. (Order 143, Bureau of Animal Industry.)

Tuberculosis of Animals. (Bulletin 145, Maryland Agricultural Experiment Station, College Park, Maryland.)

Poultry Notes. (Bulletin 179, Maine Agricultural Experiment Stations.)

The Influence of Feeding Sugar Beets and Mangels to Breeding Animals with Special Reference to the Formation of Renal and Urinary Calculi. (Bulletin 112, Iowa Agricultural Experiment Station, Ames, Iowa.)

A Tramp Veterinarian Abroad

Do you know Dr. Lloyd Champlain of Kansas City? Well you have missed something worth while if you haven't made his acquaintance. Educated for the ministry but better known as a veterinarian, Dr. Champlain is a photographer, a milk expert, a lecturer, a writer, an editor, but most of all a seeker after knowledge. Every few years he is off on a trip, usually afoot much of the time, to see what he may learn and to learn what he may see.

What he sees and learns in his wanderings is written up by Dr. Champlain in the form of stories for as has been said, Dr. Champlain is a writer of no mean worth. His serial story appearing in *The Milk Man* two or three years ago, entitled "Where to go and What You'll see among Eastern Dairies" embodies the best description published of conditions existing in well-kept and in ill-kept dairies.

Before this reaches its readers Dr. Champlain will have started on a two-year trip through Europe. He will write stories on veterinary science, veterinary practice, animal husbandry, medicinal plants, dietetics, etc., as he *sees* them, illustrating his articles with photographs and drawings. We have made arrangements with the Doctor for a monthly "Story" and can promise our readers they will enjoy reading each one.

Statistics of Tuberculin Tests and Post-Mortem Findings

These tests were made by different veterinarians, and under ordinary varying conditions and circumstances.

Number of animals tested and condemned. 2002
Number of generalized cases. 636
Number of localized cases. 1295
Number with no lesions. 71

Generalized about 32 percent		Localized about 65 percent	
Temperatures 102-103...	1 percent	Temperatures 102-103...	1 percent
" 103-104...	5 percent	" 103-104 ...6	percent
" 104-105 ..19	percent	" 104-105...26	percent
" 105-106...75	percent	" 105-106...72	percent

No Lesions, about 3 percent

Temperatures 103-104...30 percent
" 104-105...20 percent
" 105-106...50 percent

Number affected in	Glandular Tissues. 1740	87	percent
" "	Lungs 821	41	percent
" "	Missc. parts and organs.....1001	50	percent
" "	Udders 51	2.5	percent

Breed, Number and Per-centum of each Breed Tested and Condemned

Ayrshire. 76	3 1-2	percent	Durham Grade. 9	.04	percent
Ayrshire Grade 28	1 1-2	percent	Guernsey. 30	1 1-2	percent
Dutch Belt. 8	.04	percent	Guernsey Grade 44	2	percent
Durham. 15	.07	percent	Holstein. 280	15	percent
Holstein Grade. 390	20	percent	Grade. 314	15	percent
Jersey. 262	14	percent	Swiss. 40	2	percent
Jersey Grade. 206	10	percent	Swiss Grade. 85	4	percent
Native. 214	10	percent			

The foregoing exceedingly interesting chart was exhibited by Dr. J. F. De Vine at New York State Veterinary meeting. This includes the tuberculin test on something like 12,000 animals. The most important fact disclosed by the foregoing statistics is that the degree of elevation of the temperature above normal during a reaction to tuberculin bears no relation to the stage of the disease present or the extent of the lesions. It has been commonly taught that a high temperature during a reaction to tuberculin indicates a recent infection and a temperature rising but two or two and one-half degrees during the reaction indicated an advanced case of tuberculosis with extensive lesions. The above figures controvert this teaching.

These statistics further indicate as is generally believed, that tuberculosis is not more prevalent in one breed of cattle than in another but that its

prevalence or absence is dependent upon the environments of the individual herds.

Army Veterinary Legislation

The agitation for legislation favorable to veterinarians in the United States Army seems interminable. It is to be hoped that efforts on the part of the whole veterinary profession to induce Congress to enact some much needed army veterinary legislation will not cease until it has accomplished its purpose.

At the late session of Congress, an army veterinary bill passed the Senate but did not come to a vote in the House. This bill, known as Senate 1692, while not entirely satisfactory to the Army Veterinarians, would constitute an improvement on present legislation governing the Army Veterinary Department. The campaign for this bill will have to be short and decisive if it is taken up and passed at the coming short session of Congress, which convenes December fifth next.

Every veterinarian has now an opportunity to do a good turn to the Army Veterinarians and incidentally to the whole profession. Write your Representatives and Senators in Congress and tell them that under existing laws the veterinarians in the Army are not accorded the recognition to which their worth entitles them. Tell them that, to be appointed to the position of Veterinarian in the Army one must be graduated from a high-class veterinary college and must pass a practical and theoretical examination. It requires about ten days to complete this examination which is so difficult as to require a basic college education of those who pass. Yet the Army Veterinarians are not given commissions and are not granted the privilege of retirement for disability or long service. They are not allowed commutation of quarters or the right to select quarters according to the length of service. They are neither enlisted men nor commissioned officers.

Tell your Representatives at Washington that anything they can do to improve the present status of the Veterinarians in the Army will be appreciated by you as a personal favor.

Letters of this nature from all veterinarians would accomplish much, for there is practically no opposition to this legislation; only an attitude of indifference.

The Work of the Pasteur Institute

The Chicago Pasteur Institute for the Treatment of Hydrophobia and the study of Infectious Diseases, in its nineteenth annual report, announces that since its inauguration, 4158 patients have received antihydrophobic treatment. Of these 1583 came from Illinois, 659 from Ohio, 355 from Wisconsin, 224 from Iowa, and 208 from Indiana. Only 8 patients died, equivalent to a mortality of 1.9 per 1000. Of the cases

reported 3651 were bitten by dogs, 151 by cats, 134 by horses, 37 by skunks, 6 by wolves, 65 by cows, 14 by squirrels, 2 by burros, 7 by coyotes, 8 by mules, 9 by pigs, 2 by sheep, 14 by calves, 1 each was bitten by a rat and a monkey, and 56 were infected by hydrophobic human beings.—*Jour. Amer. Med Assoc.*, 54-11.

Things Worth Remembering

TO REMOVE PLASTER OF PARIS CASTS: Wet the cast with peroxide of hydrogen where it is desired to crack it. After two or three minutes it will crumble easily.

TO AFFIX LABELS TO TIN: Labels separate from tin because the paste becomes dry. To obviate this extreme drying, glycerine is used. The following is given in Henle's Book of Formulas to attach labels to tin:

Tragacanth	4 drs.
Acacia	2 ozs.
Thymol	7 grs.
Glycerine	2 ozs.
Water, q. s.,	2 pts.

Dissolve the gums in one-half pint of water, strain and add the glycerine in which the thymol is suspended; shake well and add sufficient water to make one pint. This separates on standing, but a single shake, mixes it sufficiently for use.

TO REMOVE ADHESIVE TAPE: Soak it well with 75 per cent alcohol and remove after a minute or two with a quick movement.

TO KEEP FLIES FROM WOUNDS: A "shoo fly" that no fly of any kind will go near and that will remain on a wound for several days is made as follows:

Carbolic-acid	1. dr
Turpentine	1 dr.
Sweet oil, q. s.	4 ozs.

Mix and shake vigorously before use. Besides being, where applied, an effective preventative of infestation of wounds by screw worm-, maggot- and other flies, this preparation is an active stimulant to granulation and not objectionable to the attendant.

TO LIQUEFY CARBOLIC ACID: Alcohol is preferable to water for liquefying carbolic acid crystals, but use only enough to liquefy the crystals (about 5 per cent). If more than enough alcohol is used to liquefy the crystals it impairs the activity of the carbolic acid.

Staphylococcus Bacterin to the Rescue

About the first of February, 1910, the Cryptorchid operation was performed on an M. Troop horse. On operating we found the left testicle in the abdominal cavity high up towards the back. The cord was so short it was difficult to get the emasculator around it, so a silk ligature was applied around cord and the testicle cut off.

Wound healed rapidly and animal was sent out on the large maneuvers held in Central Luzon the last of the month.

Coming back from maneuvers the incision was still open and a discharge of creamy pus was always present every morning.

This was treated regularly first by trying all the various antiseptics, then tincture iodine was tried, also 10-percent solution of silver nitrate, but nothing would stop this discharge. It smeared up the inside of both hind legs. As the animal showed no ill effects he was kept at drill, though his rider had to wash the hind leges every morning.

After trying all kinds of injections, examination per rectum was made about June first, which revealed the end of the cord adherent to the peritoneum just above the left internal inguinal ring.

In preference to throwing the animal and trying to operate we decided to try the home-made staphylococcus bacterin I had made from the horse with the abscesses. [The report of this case will be published next month. —ED.]

June 5, 1910, 10 Cc. of bacterin was injected. Thirty-six hours afterward the discharge had diminished greatly and on the second day there was no need of washing the legs as heretofore.

June 9, 1910, 10 Cc. of bacterin was given. The discharge was barely noticeable.

June 14, 1910, 10 Cc. of bacterin injected. Two days after this injection the discharge had ceased altogether and wound almost healed. Animal has since entirely recovered and we have only the scar to remind us of the many days of trying out the various injections.

ROBERT J. FOSTER.
Veterinarian 12th U. S. Cavalry.

Fort Wm. McKinley,
Rizat, P. I.

Arecoline Hydrobromide and Strangulation

When you inject 1 1-2 gr. of arecoline and fail to get the characteristic action, i. e., salivation and increased peristalsis, is it diagnostic of strangulation? I will venture to say that in every case where you use arecoline and get no action whatever, your case will terminate fatally. Am I right? Let me hear from others. F. R. S., D. V. M.

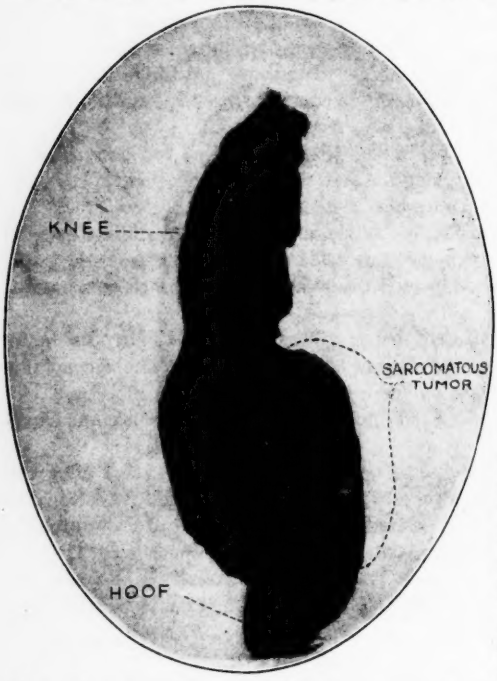
Batavia, O.

[We think your statement too broad. It requires more than 1 1-2 grains of arecoline hydrobromide to cause a free flow of saliva in some horses. One in particular we recall that exhibited only slight salivation and no peristalsis from 4 1-2 grains of arecoline given in divided doses. Other treatment seemed equally futile until another practitioner used a stomach tube on the case and soon had him at work.

We pass these questions on to the readers.—ED.]

A Leg-Amputation in a Jack

The accompanying cut shows the leg of an eight-year-old jack ut aampted by Dr. E. V. Dunbar, Cashion, Oklahoma, assisted by Dr. S. H. Adams.



The portion of the leg shown in the cut weighed *fifty pounds*. At the time of the operation the jack was in an exceedingly marasmic condition from the effects of the enormous cancerous growth and the prognosis was very unfavorable.

This animal showed no improvement in his general condition following the amputation and died two weeks after the operation. Had the operation been performed a couple of months earlier, it is believed the animal would have recovered and his usefulness for breeding probably been preserved for a number of years.

WE ARE indebted to Dr. Chas. Frazier, 1639 Wabash Avenue, Chicago, for the information that the article on "Parturient Paresis" published in the July issue was published by Dr. A. J. Damman, Ellenburg, Washington, in the Journal of the McKillup Veterinary College Alumni Association, two or three years ago.

NEXT month we are going to have the usual number of good articles, but we cannot help but boast of the possession of two articles of unusual value that will be published next month. One is by Dr. Robt. J. Foster of the 12th Cavalry, U. S. A., relating his experience in the preparation and use of bacterins. Dr. Foster's clinical reports are made out in detail and with more than usual care, this article cannot fail to interest every veterinarian engaged in practice or teaching. The other article

referred to is one by Dr. D. H. Cochran of New York City and embodies his experience of more than thirty years in the treatment of azoturia. Dr. Cochran's opportunities for studying and treating this little-understood malady have been unexcelled. His known ability and marked success as a practitioner is sufficient guarantee of the value of his paper.

WE take this opportunity to again remind our readers that we want them to send us short snappy articles on experiences in their practice, case reports, discussions of papers published, etc. Every reader has as much right to his say as has the editor to his. If the JOURNAL is to continue to be as it has been in the past the most helpful publication for veterinarians on the continent it must continue to be as it has been in the past with your help.

IT is with deep regret that we this month have to report the passing of two of the leaders in the veterinary profession. Dr. Andrew Smith, formerly Dean of the Ontario Veterinary College and Dr. Simon J. J. Harger of the University of Pennsylvania, have both died during the past month.

IN these products [serums, vaccines, and bacterins] the medical profession has an agency equally as potent and exact as drugs and one whose limitations are still unknown.—Editorial, *Journal American Medical Association*, 44-4.

A Minnesota veterinarian wants to exchange a good stylish blk. g. 6-year-old pacer for a good trotter. Address 48 care of AMERICAN JOURNAL OF VETERINARY MEDICINE, 1926 Wilson Avenue, Chicago.

Case Reports

An Eversion of the Uterus

An eleven-hundred-pound, aged, bay mare, after an apparently normal parturition gave birth to a vigorous foal. The placenta appeared to be all rejected and she seemed in first-class condition.

Two days later she suddenly began to strain and in a few minutes the entire uterus was everted.

Three hours later I found her lying very quietly with her head lower than the hindquarters. She had been struggling a good deal; the uterus was completely covered with dirt and manure and there were a number of lacerations of the mucous membrane.

I had not gone prepared for this kind of a case and had nothing with me to relieve the pain but morphine of which I gave her two grains hypodermically.

I cleansed the uterus as well as possible with a hot antiseptic solution and without a great deal of trouble replaced the parts and got them pretty well adjusted internally, then used four very deep interrupted tape sutures. I then gave hypodermically 1-2 gr. strychnine sulphate and 20 c.c. diluted nuclein solution. In about twenty minutes we had the mare up and placed her in a narrow stall that was filled up high behind. We kept her in this stall four days and nights.

The next day after replacing the uterus, I gave 20 cc. diluted nuclein solution and put her on a stimulant tonic of fluid extract of nux vomica, fluid extract of gentian and Fowler's solution. The uterus

and vagina were flushed out with a weak antiseptic solution. The mare was now apparently doing nicely; her pulse was 48, temperature 101.6° F., appetite good, and she was apparently satisfying the foal.

Two days later I found her pulse 45, temperature 100.3° F. and vaginal discharge almost ceased. She was doing nicely. I gave her 20 cc. more of the diluted nuclein, flushed out the vagina and after walking her slowly for half an hour, removed sutures from the vulva and left instructions with owner to continue the tonic and keep her in the inclined stall several days longer. Two weeks later owner reported that he had put the mare to work and she was doing finely.

I report this as it was the first case of the kind that I have had in eleven years' practice; though I have met this condition quite frequently in cows.

HERBERT HOOPES, V. M. D.
Belair, Md

A Horse Without Jugulars

On the night of July 17th, 1902, I was called out of town to see a two-year-old colt that had been cut on a wire fence across the throat at the junction of the upper and middle thirds. The wound had been sewn up when inflicted, which was about a week before I saw it, but something had caused a necrosis and everything, skin and all, had sloughed out to the depth of one-half to one inch, exposing both jugulars and the trachea. The left vein was open and it is not necessary to estimate the amount of blood lost, but by plugging with Monsel's solution and tying his head up the colt seemed safe for the night.

The next day I opened up the wound and found the right jugular also open. I passed a soft ligature around it and tied it. The left vein was closed by a clot but three days later it broke open again and was ligated. Both jugulars were now ligated and their function destroyed. The colt's head became about the size of a salt barrel but by keeping him tied up and using hot packs he recovered slowly but nicely and is today doing his work all right. I drove him last week and he travelled well. He is now ten years old. I have been waiting for eight years for him to die so I can find out how his circulation was re-established, but he is still

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Odorless on use and non-staining. All the virtues of ichthyol without its drawbacks. **Send for sample and literature.**

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here. This horse's head swells yet if he is turned to pasture. He has been kept stabled during the past eight years. What becomes of the blood that goes to this horse's head?

IRA M. GREGG, V. S.
South Brownsville, Pa.

Two Serious Cases Successfully Treated

BY C. F. VON STOLBERG, V. S., OCEANSIDE, SAN DIEGO CO., CAL.

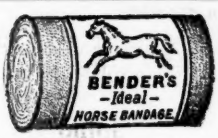
Case 1. A six-year-old, black mare, weighing fourteen-hundred pounds. She was pregnant and in the sixth month. I found her with a greatly swollen right-hand leg, and a much distended udder and belly. Her temperature was 105.5° F. I counted thirty-seven ulcers, differing more or less in circumference. Seventeen of these had burst and emitted a foul-smelling, thin oily pus. Two of the largest ulcers had developed upon the udder; the others were spread over the entire right side of the suffering animal. After thoroughly opening the bowels, I opened all the ulcers which were in condition to be lanced, and then prepared a lukewarm solution of Chinosol (3 tablets to a quart, this being about 1 to 333). With this solution I cleaned out each of the ulcers. I then took 4 grammes of powdered Chinosol, using a small pinch of it in each of the cleansed ulcers. To avoid the possibility of infection, I covered each ulcer with absorbent gauze and absorbent cotton dipped in flexible collodion. I then prepared an ointment of Chinosol and lard (first, as is necessary, dissolving the Chinosol in the smallest possible quantity of water) and ordered the ulcers to be smeared (after twenty-four hours) with this ointment three times a day until I could next see the animal. Before leaving, I prepared some powders for use in my absence, the powders containing,

Aloin	grs. 20
Gentian powder	oz. 1-2
Calamus powder	dr. 1-2
Charcoal	oz. 1
Powdered ginger	oz. 1

Divided into twelve powders,

with instruction that two powders should be given each day. Four days later, I saw the mare again and I was pleased, though not surprised, to find that the fever had gone down to 101.2° F. The belly and udder were nearly free from swelling, and I could find but nine ulcers and these were healing. The swelling on the leg was greatly reduced, and the mare's coat glossy. Within a few days there was but one ulcer remaining and that one very promptly healed. In this case I had told the owner to use an injection every evening consisting of one-and one-half gallons of lukewarm water in which he should dissolve three grammes of Chinosol. The antiseptic character of these injections was of infinite value to the mare. As she was located upon a farm twenty-eight miles from my home, I had to rely upon others to carry out my instructions. If I had been able to see the mare at shorter intervals, the result would have been secured more promptly, though the final outcome (two weeks after my first visit) could not have been more satisfactory. The owner of the mare came to my office on that day and reported that she had completely recovered.

Case 2. A mule weighing sixteen hundred pounds, six years old, of compact build, and very powerful frame. The animal was suffering from some internal disease, and its owner, a half-breed Mexican, being very lazy, like most of his people, had done practically nothing to

Bender's Ideal 

Horse Bandage

Bender's Ideal Bandage is an elastic bandage without rubber, brown in color, open in weave, allowing the perspiration to evaporate, preventing inflammation. They are used extensively in France and Germany. They take the place of rubber bandages and have the advantage of not deteriorating with age. For sale by all large Veterinary Supply Houses. If your dealer cannot supply Bender's Ideal Horse Bandages, send us a postal for descriptive matter and names of Supply Houses who carry them in stock.

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relieve the animal. He first took the mule to a quack veterinarian who did not improve its condition, and when the animal was brought to me, I questioned whether I could be of service. I found it to be a very sick animal, with a temperature 104.5° F., no appetite, but with an excessive thirst. Could find no organic trouble with lungs, liver, heart or kidneys. Mouth abnormally hot and very dry; the breath very foul and offensive. The droppings of the animal were dark colored, almost as dry as dust, and mixed with bloody pus. The animal was almost a skeleton, the hair standing erect in most unprepossessing fashion. The animal was hide-bound, the *ensemble* of symptoms indicating to me that the trouble was due to internal abscesses. The indications were that the trouble did not exist in the stomach, but that the intestines were at fault. I feared the possibility of cancer. The animal was evidently suffering great pain and after giving a hypodermic of H-M-C to reduce the pain, I gave a rectal injection of two gallons of hot water in which I dissolved four tablets of Chinosol, and sixty drops of glycerine. Before giving this injection, I examined the rectum and found it full of hot feces clear up to the sphincter ani. I slowly injected one quart of the Chinosol solution above mentioned to moisten the feces, exerting pressure against the anus, so that the animal might retain the solution as long as possible and thus aid in liquefying the feces. This was done for a period of five minutes. After the evacuation, I cleansed the rectum and colon by hand, and again gave a rectal injection of one and one-half gallon of Chinosol solution of the same strength as above mentioned.

As the patient began to show signs of returning peristalsis, I got my stomach pump ready. I prepared a lukewarm Chinosol solution (1 to 500) and very slowly administered two quarts so that the solution might enter the stomach gradually. After twenty minutes I used the stomach pump, also requiring the assistance of the owner of the mule. That which we pumped from the stomach of the animal was most foul-smelling. The color of it was almost black, though not resembling coffee grounds, thus showing that my suspicion of cancer was not correct. I caught about two gallons of this fluid in a bucket, continually pumping until the stomach was emptied. In the meanwhile the purgative had done its work, and it would be impossible to imagine a more horrible or fouler smelling substance than that which was evacuated. My object was, as nearly as possible, to empty the entire alimentary tract and apply the best possible antiseptic. The animal had been constipated for about two weeks, there being an evacuation only on alternate days, the colon was impacted with dried manure. There evidently was auto-intoxication, hence, the fever. The intestines were distended to their fullest limit, in fact, there was the danger of rupture in some portion. I had to use my hand again to relieve the pressure upon the overworked and distended colon. The evacuation filled four ordinary buckets. I found blood clots and pus in the feces, although a smaller amount than I had looked for. I gave the animal a hypodermic of P. D. & Co's. Cardiac Tonic, and again explored the rectum with my oily hand carefully going down the bend, so that through the empty lower bowel, I could feel a tumor not far distant from the rectum. This tumor was about the size of a chicken egg, and was already exuding pus. As it was discharging itself, I concluded to let it alone for a few days, but insisted that the owner should give the animal two rectal injections daily, each injection containing one quart of boiled water with two tablets of Chinosol dissolved therein. I built up the general physical condition of the animal and within two weeks the temperature was normal, and the animal apparently in perfect health. Four and one-half weeks have elapsed. The hair upon the animal is glossy, the skin normal, the animal is gaining in weight, there is no evidence of ill health and the mule is working daily.

The Chinosol, although non-poisonous, has shown itself to be a far better anti-

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septic than either carbolic acid or bichloride of mercury, and I have removed those two products from my shelves entirely. There is a comfort in knowing that we can get complete antiseptic effect from Chinosol without the least danger of poisoning the patient.

Annual Meeting in New York

The twenty-first annual meeting of the New York State Veterinary Medical Association at Ithaca, August 25th, 26th and 27th was a very successful one viewed from every angle, except perhaps that of attendance. How all the veterinarians, but seventy-five, in the great State of New York can content themselves to be absent from such a meeting is past understanding.

The next meeting of the Association will be held in Brooklyn, the date to be announced later. It is hoped this meeting will have a better attendance.

Heat a Therapeutic Agent of Great Value

The wide and continually increasing use of heat in the treatment of inflammation is one of the interesting phases of this progressive therapeutic age. Owing to the inconvenience of applying heat in veterinary practice, it has heretofore been used, mainly on man.

The catalogue of any general surgical supply house will show a great number of contrivances for the application of heat, ranging from the simple hot-water bottle to the most complicated vapor cabinets. Health resorts, while they largely advertise their mineral baths, sulphur baths, mud baths, etc., depend in a large measure for the success of their treatment upon the rest, massage and the variously applied heat.

In the practice of human medicine, the newest and best means of applying heat yet devised is an oven-like apparatus into which a foot or an arm or leg may be placed and literally baked—exposed to dry heat at a very high temperature. The relief of pain is almost instantaneous and inflammation, either superficial or deep-seated, acute or chronic, if remedial at all, is beneficially effected by this intense heat.

For use in treating the larger animals a hot-water bottle is not applicable, bathing the inflamed part with hot water is laborious and seldom efficiently done, the hot flax-seed poultice possesses value but is badly out of date in these days when asepsis is so highly valued, the bake-oven is not to be thought of as any but a dead horse or cow would unfailingly kick it out of the barn.

There is, however, a convenient means of applying heat in veterinary practice new in this country, but better known in Europe, where it is said to have met with great favor. I refer to *thermozine*, by which dry heat at a very high temperature can be readily applied to any exterior part of an animal and maintained for hours.

The product is yet on trial with the veterinary profession, but it promises very much. Trials so far made and reported have all enthusiastically praised it.

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Automobiles and Other Cases

The automobile has taken the place here of nearly all the fancy drivers and carriage teams, which class of trade was the easiest to handle with best returns.

I think every veterinarian is entitled to a machine, they're mighty fine. That is why they hurt.

During May and June I treated three cases of traumatic tetanus, one in a mule and two in horses. In the beginning each received two full doses of fluid extract of aloes. This was followed by bran mashes, alfalfa hay, water and an open lot.

No higher-priced serums were used; all three cases recovered. Did the comet do it?

A brown, ten-year-old mare had colic. The owner said it was from constipation. I tried arecoline, aloes, Ol. Lini, Ol. Ricini, Ol. Tiglii and high rectal injections without results. The autopsy disclosed three calculi in the floating colon. The largest weighed eleven ounces. The intestine was completely plugged and its contents semi-fluid.

J. D. RINKER, D. V. S.
Galveston, Tex.

An Automobile Enables a Veterinarian to Do a Larger Practice

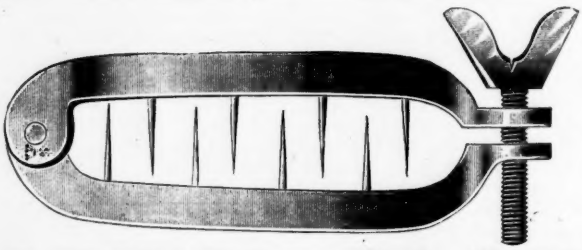
In my opinion, a veterinarian is justified in riding in an automobile just as much as he is in a trolley-car or railroad-coach and many veterinarians are almost compelled to use autos, if they expect to get through with their routine work. I am not the owner of an auto, but I believe I would earn a good many more dollars in the course of the year if I were, as I have a country practice and very large territory to cover.

HERBERT HOOPES, V. M. D.
Belair, Md.

Finds Use for both Automobile and Motor Cycle

I am using a Victor auto in my practice with fair satisfaction. It is very satisfactory when the roads are good. Whether or not I should advise a veterinarian to purchase an auto would depend upon his possession or lack of mechanical turn of mind. I find a motor-cycle quite useful in my practice.

A. CULVERWELL.
Concordia, Kan.



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